HIRSCHSPRUNG'S DISEASE AND MONGOLISM

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Two mongoloid patients with Hirschsprung's disease are presented. Mongoloid children who have severe constipation should be investigated for Hirschsprung's disease.

Congenital heart disease, leukemia, duodenal atresia, imperforate anus, and thyroid disorders are well known complications of mongolism. The association of Hirschsprung's disease and mongolism has been reported in the literature,[1,2] but the significance of this combination has often been overlooked. The purpose of this communication is to report two more cases of mongolism and Hirschsprung's disease, emphasizing the significance of this association.

CASE REPORTS

Case 1

A male baby was born to a 29-year-old woman, gravida 1, para 0, at 37 weeks gestation following a normal pregnancy. Cesarean section was performed because of prolonged rupture of membranes (72 hours) and the delay of active labor. The birth weight was 2,960 g, and the Apgar scores were 2 and 8.

The infant had the following features of mongolism: flattened facies, round brachycephalic head, epicanthal folds, small low-set ears, bilateral short fifth fingers with mild clinodactyly, bilateral simian crease, wide space between first and second toes, and hypotonia. He had patent ductus arteriosus. Chest x-ray films showed only 11 sets of ribs, and chromosomal analysis confirmed the diagnosis of trisomy 21.

In the neonatal period, he had prolonged hyperbilirubinemia, constipation, abdominal distension, and vomiting. Thyroid function studies were normal (serum thyroxine 10.6 μg/dL, triiodothyroxine 114 ng/dL, T_3 resin uptake 38.8 percent, and free T_4 index 4.11). Abdominal x-ray films showed colonic distension. A barium enema at 5 days of age showed spasticity and uniform caliber of the rectum consistent with Hirschsprung's disease. A rectal biopsy confirmed the diagnosis of aganglionic megacolon. Subsequently, a gastrostomy and transverse colostomy were performed.

At 11 months of age, he had a Soave endo-rectal abdominal perineal pull-through operation. He was readmitted to the hospital two months later with toxic megacolon leading to perforation of the colon and septicemia. A laparotomy revealed generous amounts of purulent fluid in the abdominal cavity and a lacerated portion of necrotic

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transverse colon, which was resected. A peritoneal toilet was done and the abdomen closed. On the fifth hospital day the patient sustained a cardiac arrest and died.

Case 2

A 17-day-old mongoloid infant presented with abdominal distension and constipation. The infant was born to a G8P7 45-year-old woman at term. Birth weight was 3,400 g, and the Apgar scores were 7 and 9. The diagnosis of mongolism was suspected at birth and was confirmed by chromosomal study. Because of constipation, a barium study was done, which was consistent with Hirschsprung's disease. This was later confirmed with a rectal biopsy. A proximal end transverse colostomy was done when he was a month old. He had numerous chest infections in the first year of life. Definitive surgery with resection of the aganglionic segment and a pull-through anastomosis was performed at 19 months of age. He had an uneventful recovery. Follow-up 14 months later showed that he was thriving and bowel movement was satisfactory.

DISCUSSION

Hirschsprung's disease results from an absence of ganglion cells in the submucous and intramural plexus in the bowel. This is due to failure of migration of nerve cell elements from the neural crest in a cephalo-caudal direction along the gastrointestinal tract. In the majority of cases, this is confined to the rectum and pelvic colon, and in about 1 percent of cases, it extends throughout the small and large bowel.

Hirschsprung's disease has a heterogenous etiology; it may be caused by genetic, chromosomal, and other yet unknown factors. The incidence of Hirschsprung's disease is 1 in 5,000. The presence of an extra chromosome, number 21, results in mongolism (trisomy 21 syndrome); the incidence of this is 1 in 600 live births. The coincidental occurrence of these two abnormalities is more than can be accounted for by chance. In 1956, Vacher et al[1] reported the death of a 38-day-old mongoloid infant due to perforated colon. The diagnosis of Hirschsprung's disease in this infant was verified at death. Bodian and Carter[2] reviewed the records of 207 patients with Hirschsprung's disease seen at the Hospital for Sick Children, London, from July 1948 to December 1959, and found that three of these patients had mongolism.

As with duodenal atresia, Hirschsprung's disease may be associated with mongolism. It is possible that the genes for Hirschsprung's disease are located on chromosome 21. More likely, the anomalies of fetal development associated with the chromosomal anomaly could interfere with the migration of the nerve elements from the neural crest to the intestinal tract. An early disturbance could cause a long aganglionic segment, while a later disturbance could produce a short aganglionic segment. This could also account for the simultaneous occurrence of Hirschsprung's disease with other chromosomal anomalies as described by Hayward and Cameron[3] and Butler et al.[4] There is also an increase in the incidence of imperforate anus with either mongolism or Hirschsprung's disease,[5] suggesting that they have some common etiology.

Constipation in mongoloid children is common. It is often attributed to hypotonia or hypothyroidism; the latter is more common in mongolism. Hirschsprung's disease is often overlooked, and it may well be more common than currently appreciated. Mongoloid children with constipation deserve a thorough investigation for Hirschsprung's disease.

Literature Cited

1. Vacher LB, Garcia NM, Palacio AG. Hirschsprung's disease in a 38 day old mongoloid. Rev Cubana Pediatr 1956; 28:473-484.

2. Bodian M, Carter CO. A family study of Hirschsprung's disease. Ann Hum Genet 1963; 26:261-271.

3. Hayward MD, Cameron AH. Triple mosaicism of sex chromosomes in Turner's syndrome and Hirschsprung's disease. Lancet 1961; 2:623-627.

4. Butler LJ, France NE, Russell A, et al. Chromosomal aberration associated with multiple congenital malformations. Lancet 1962; 1:1242.

5. Kiesewetler WB, Sukarochana K, Sieber WK. The frequency of aganglionosis associated with imperforate anus. Surgery 1965; 58:877-880.